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REVIEWS OF RECENT LITERATURE.

ALTEN H., UND JÄNNICKE, W.—*Eine Schädigung von Rosenblättern durch Asphaltdämpfe*: <Bot. Zeit., 49. Jahrg., Leipzig, March 20, 1891, pp. 195–199; *Nachtrag zu unserer Mittheilung über "Eine Schädigung von Rosenblättern durch Asphaltdämpfe."* <*Ibid.*, Sept. 25, 1891, pp. 649–650.

What Prof. H. Marshall Ward has done for the parasitic diseases of plants caused by *Botrytis* has been accomplished by the authors of the present papers for a nonparasitic disease of rose leaves caused by asphalt vapor; that is to say, a rational and connected account has been given of the exact course of the malady. The rose leaves in a garden were injured in a very peculiar manner by asphalt vapor generated during the construction of a neighboring street. The injury was noticed in a strip running 150–200 meters southwest from the asphalt kettles. The injury was seen after a rain accompanied by a northeast wind. During clear weather no injuries were observed. The injured leaves showed a pronounced browning of the upper surface, became withered, and finally fell. In many instances the twigs bearing such injured leaves also died. A remarkable fact was that only the upper side of the leaves exposed to the rain were browned. Inverted leaves were browned on their under surface. When one leaf lay over another the under one was free from injury. Microscopic examination showed that only the epidermal cells were damaged, these having a brown, granular cell content. There was a great difference in the amount of injury to different plants; roses were injured most and then strawberries, while delicate-leaved begonias remained entirely sound. Such, in brief, were the symptoms of the disease, and to explain the exact manner in which the asphalt vapor caused the peculiar injuries was now the task of the authors. The action of poisonous gases (such as sulphurous acid) was excluded by the fact that only the upper surfaces of uncovered leaves suffered. Sections showed that there was no appreciable deposit on the upper surface of the leaf, and consequently the damage was not due to a body mechanically carried down and deposited by the rain on the leaves. It then became clear that the injury must be due to a soluble substance brought down by the rain and absorbed by the leaves. Curiously enough, the character of the epidermal wall seemed to exercise no influence in the matter, since delicate begonia leaves were spared, while coarse rose leaves, with thicker-walled epidermal cells, suffered. One thing, however, was soon determined, and that was that the injury stood in definite relation to some substance held in solution in the cell sap. The amount of injury to the cells was found to depend upon the amount of tannin contained in them. This explained why begonia leaves were exempt, for they contained no tannin. It was now necessary to determine which constituent of the asphalt vapor caused the precipitation of the tannin.*

It was found that slight quantities of iron were contained in the vapor and that this caused the damage. The iron was supposed to be in the form of ferrous salts or possibly in the finely divided metallic state. In the "Nachtrag" the authors report the results of trials made to determine the effect of various iron salts on rose leaves. Metallic iron in suspension failed to produce the very evident coloring of the epidermal cells; ferrum redactum caused dark spots here and there, but ferrous and ferric chloride and ferrous and ferric sulphate in solution produced a dark coloration resembling that caused by asphalt vapor. All four solutions last mentioned, with the exception of ferric chloride, brought about a precipitation of the contents of the epidermal cells. Ferric salts also injured the chlorophyll grains, turning them yellow. These experiments confirm the authors in their supposition that the injuries to the rose leaves were due to iron present in the asphalt vapor. Such papers as this are genuine contributions to vegetable pathology, and it is to be hoped that their numbers will increase in the future.—W. T. SWINGLE.

COOKE, M. C.—*Handbook of Australian Fungi.* London, 1892, pp. XXXII, 458, pl. 36.

This volume, the latest of many that have appeared from the pen of Dr. Cooke, is a useful addition to the literature on fungi, and must be welcomed by all students fortunate enough to secure a copy. Only a limited edition has been printed, and the larger part of it has gone to Australia. The reason for this is manifest from the title page, for it is there stated that the volume is "published under the authority of the several governments of the Australian colonies," "for the Departments of Agriculture in Melbourne, Brisbane, Sydney, Adelaide, Hobarton." The value of the book does not arise from any novelty of arrangement or description of new species, but in its being the collection of descriptions scattered through many widely distributed and frequently nearly inaccessible papers and monographs. It embodies the latest views of the author in regard to classification, a subject now receiving general attention from students. As will be seen, Dr. Cooke is not in entire accord with some of the newer schemes presented for acceptance.

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* It is probably the weakest point in the paper that this tannin (Gerbstoff) was not more carefully studied. Le Merchant Moore has shown (On Epidermal Chlorophyll, Jour. of Bot., vol. XXV, p. 362) that the epidermis of some plants contains a substance giving the reactions of tannin with iron salts, but showing a blue or purple color with iodine and failing entirely to give the reaction for tannin with potassium bichromate, either alone or with iron salts and Millon's reagent. Kraus, however, considers this a tannin, but Dufour (Recherches sur l'amidon soluble, Bull. Soc. Vaud. d. Sci. Nat., vol. XXI, No. 93, 1886) regards it as a carbohydrate. Reinitzer (Der Gerbstoffbegriff. <Lotos, neue Folge, 11, 1891) insists that simply calling a substance tannin tells almost nothing of its real nature, especially in a case like this, where we are in doubt as to the exact reactions it gives.